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# Car-Free Day: Taking Back the Streets

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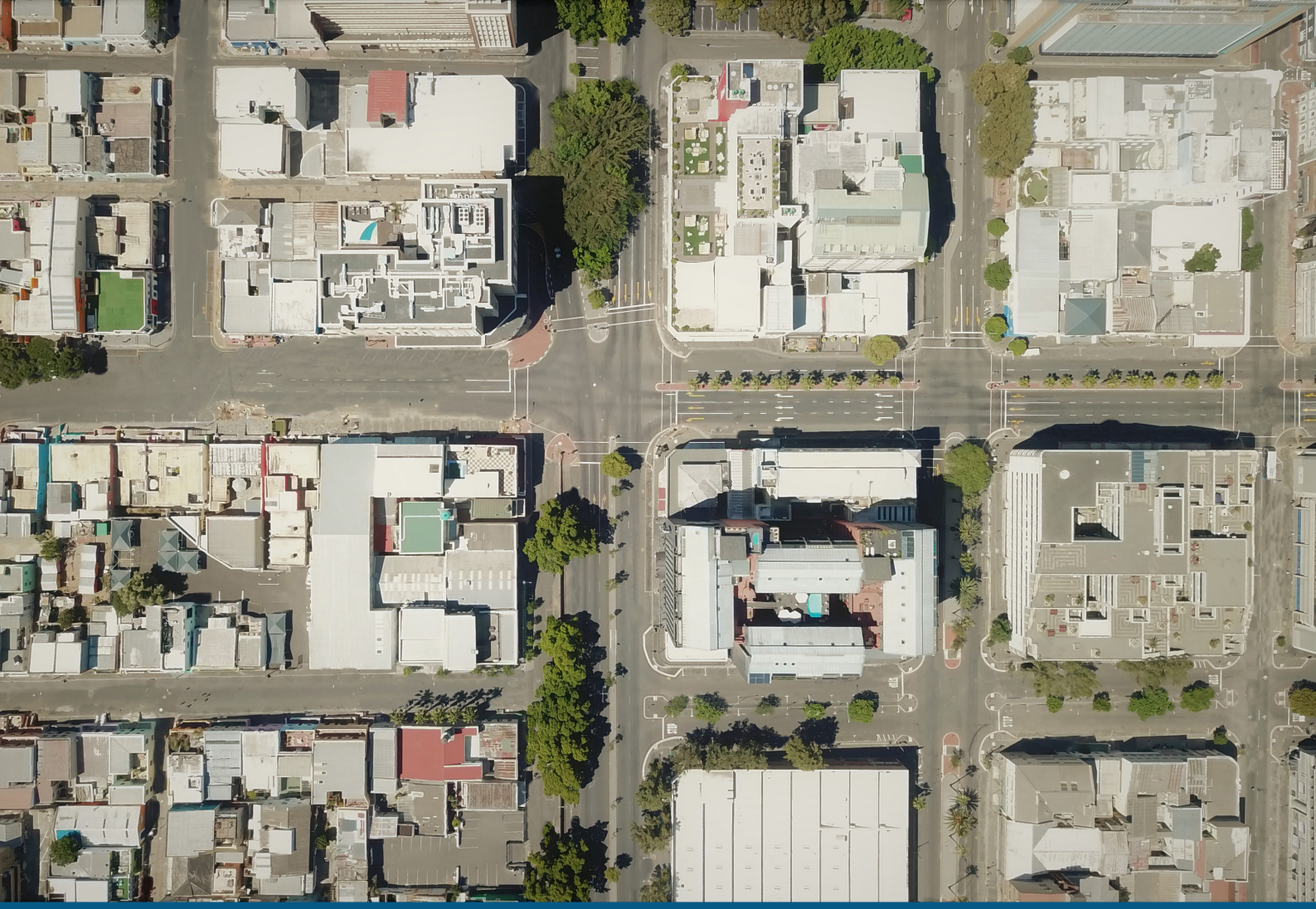

# Car-Free Day: Taking Back the Streets

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# Car-Free Day: Taking Back the Streets

An Interactive Qualifying Project Report submitted to the faculty of Worcester Polytechnic Institute in partial fulfillment of the requirements for the degree of Bachelor of Science

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# Abstract

Open Streets Cape Town, a community-driven organization that strives to create safer and more inclusive streets, aims to break the barriers that divide communities by considering a large scale initiative – a Car-Free Day. To investigate the potential of a Car-Free Day in Cape Town, we conducted archival research on events occurring globally, documented expert stakeholder opinions, and assessed public acceptance of a Car-Free initiative. Analyses revealed key factors for success including growing the initiative, coordinating with existing events to unite sectors of the larger community, motivating a civic response in order to reduce the need for enforcement measures, and addressing potential opposition. Different implementation options can be combined to initiate a successful Car-Free Day.

# Acknowledgements

We would like to begin with thanking our sponsor, Marcela Guerrero Casas. We are grateful for the opportunity to explore the community through this project's lens. We would not have been able to interview many of the organizations and transportation experts within Cape Town without your initial introduction. Thank you for giving us the opportunity to engage with the community and develop versions of Car-Free Days that are unique to Cape Town.

We would like to also thank our various experts that provided invaluable insight into their organizations. Thank you for helping us contextualize transportation in Cape Town. You also helped us better grasp the true socio-economic structure of the city. By taking time out of your day to meet with us, we were able to compile a large amount of information regarding the feasibility of a Car-Free Day in Cape Town. As a team, we experienced first-hand the dedication of many professionals in the community to making a more visionary city. Your help was invaluable to us.

For the residents of both Cape Town and Stellenbosch that we interviewed in both central business districts, we would like to thank you for answering our questions honestly about what a Car-Free Day means to you. Not being residents of South Africa, you helped us to better understand transportation problems within Cape Town and Stellenbosch that were not reflected by our prior research.

Finally, we would like to thank our advisors, Professors Nicola Bulled and Jeanine Skorinko. Without Professor Bulled's guidance in contextualizing the issues that surround Cape Town, we would have not realized the full scope of what our project is addressing. Additionally, thank you Professor Skorinko for thoughtful feedback and always encouraging us to reflect on our process. Thank you both for always pushing us to see past our assumptions and helping us create a report that truly reflects our learning experience in Cape Town. Without your support, guidance, and constructive criticism, we never would have been able to complete the project with the clarity we did.

# Executive Summary

Much like urban development in the United States, urban development in South Africa has involved concentrated economic activities in urban centers and cheaper housing options on city outskirts. In South Africa, low income housing options, and the corresponding movement of low-income populations to the outskirts of cities, was further formalized by colonial and apartheid era policies that required black, coloured, and Indian populations to live in certain areas, specifically areas at a distance from urban economic hubs (Turok, 2012). Consequently, low-income, black, coloured, and Indian groups travel great distances, and at great cost and inconvenience, to engage fully in economic opportunities (Cape Town Transportation and Urban Development Authority, 2016). Public transport in Cape Town is not ideal and includes unsafe and costly trains and buses that do not keep to schedule, and minibus taxis that are dangerous, unpredictable, and uncomfortable (Cape Town Safety, 2017). Public transport limitations have generated dependency on private motor vehicle travel, accessible only to those who can afford private automobiles. About 33% of the population owns a private vehicle, and this ownership increases by 4% each year (Cape Town Transportation and Urban Development Authority, 2017; City of Cape Town, 2017). This transportation situation has generated a socially excluded group (Litman, 2003), namely low-income, black populations living in townships on the outskirts of Cape Town. Furthermore, these transportation limitations and consequent inequities have limited interactions between high- and low-income (primarily black) populations.

Private vehicle dependency in Cape Town is also environmentally detrimental. Private vehicles contribute to 30% of the total greenhouse gases in Cape Town (Western Cape Government, 2013). These gases directly influence climate change and lead to human health risks from polluted air, causing thousands of deaths globally every year (Feldscher, 2011). Cape Town's private vehicle dependency also generates significant congestion. Cape Town is currently ranked the most congested city in South Africa (Cape Town Transportation and Urban Development Authority, 2017). Congested roadways increase the amount of time it takes residents to travel around the city (City of Cape Town, 2016; Ranko & Bolaane, 2011). As private vehicle ownership continues to rise with no corresponding improvements in public transportation or alternative transportation options (rideshare, bikes, foot travel), congestion, and pollution continue to worsen.

In an effort to address the increasing reliance on private vehicle traffic, organizations such as Open Streets Cape Town (OSCT) have implemented strategies to take back streets as social spaces. Open Streets Cape Town, a community-driven organization, aims to create safer and more inclusive streets through initiatives like Open Streets Days. On these days, the City of Cape Town authorizes select streets to be temporarily closed to vehicle traffic. Activities are hosted in the streets (e.g., workshops, games, art exhibits) and become platforms for experience and expression. Support from local artists, businesses, and community members make the streets come alive. To expand their efforts further, OSCT aims to implement a Car-Free Day in Cape Town, distinct from the Open Street Days, as it will not involve community festivities on the streets, but rather limit or eliminate private vehicle traffic from a designated zone in a business district in Cape Town. Such an event has the potential to bring Cape Town

communities together by raising awareness of transportation inequities and encourage expansion of alternatives modes of transport such as rideshare, bikes, and foot travel.

The goal of this project was to investigate opportunities to implement a Car-Free Day in the Cape Town or Stellenbosch central business districts. We conducted an archival review of Car-Free Days held globally, documented relevant stakeholder opinions on implementation, assessed public acceptance of the initiative, and determined feasible options and necessary resources for a Car-Free Day in Cape Town or Stellenbosch.

To develop feasible options for a Car-Free Day, four distinct Car-Free initiatives were studied closely, with particular attention paid to their unique methods of motivating public engagement and how they were enforced. Each initiative (Paris-France, Madrid-Spain, Gurgaon-India, and Sandton-South Africa) was analyzed based on: (a) the size of the Car-Free zone, (b) the types of transportation allowed in the zone, (c) enforcement of the Car-Free initiative (both governmental and civilian enforcement strategies), (d) reported benefits of the Car-Free initiative (e.g., environmental, social), (e) oppositions to the initiative, and (f) how each initiative was marketed and what ways the city was able to encourage stakeholders to become involved. These case studies were used to inform possible methods for implementation in Cape Town.

Interviews with experts involved in related initiatives or specializing in related fields of study, including urbanists, transportation engineers, and carpool companies, revealed six key components that need to be addressed for a Car-Free Day to be successful. First, pairing a Car-Free initiative with a pre-established large-scale event, such as First Thursdays during Transportation Month-October 2018. First Thursdays is an event that happens every month during which art galleries in the Cape Town CBD are open to the public for free in the evening, drawing people to the city and giving everyone an opportunity to participate. Other events include the Rugby Sevens Tournament or the Cape Town International Jazz Festival. These events could increase participation due to the observed increase in public and non-motorized transportation use during such large-scale events in Cape Town. Second, there must be viable alternatives, such as expanded public transport routes and hours, carpooling options, and Park&Rides for private vehicle users to travel into the Car-Free Zone. Third, there must be a traffic management plan to reduce the congestion around the Car-Free zone encompassing both zone entry points manned by traffic officials and a freight plan for businesses that have deliveries on that day. Fourth, incentivize public participation using creative techniques such as offering benefits or rewards from businesses and restaurants within the Car-Free zone. These rewards could be obtained by pledging to make a sustainable choice. Fifth, if the initiative begins too large and fails, it could generate significant public opposition (from private vehicle users, local businesses, metered taxi and Uber drivers, and parking garages), limit engagement, and prevent any future events. Finally, expert stakeholders noted that the Stellenbosch CBD, a major city 50km east of Cape Town, could be another viable location due to potential university participation and established non-motorized transport infrastructure.

To assess public acceptance, semi-structured interviews were conducted with residents of Cape Town (n=24) and Stellenbosch (n=20). Analyses indicate that the public is generally in favor of the initiative. Twenty-one of the 24 residents interviewed in Cape Town, and 17 of 20 residents interviewed in Stellenbosch perceived a Car-Free Day as a valuable initiative. However, private vehicle owners from both municipalities found carpooling to be the most appealing alternative to using their personal vehicles. This not only reflects the lack of viable public transportation options within both municipalities, but also highlights the need for considering more creative transportation options.

Integrating findings from the archival review, expert interviews, and public sentiments, a Car-Free Day matrix of options was generated to provide feasible considerations to implement a Car-Free Day in Cape Town or Stellenbosch. In addition, a full Car-Free Day event in Cape Town was conceptualized, involving a collaboration with the First Thursday free art exhibitions held during Transportation Month (October 2018), with both a complete Car-Free Zone of approximately 64 city blocks, and a discouraged-use zone (not enforced but encouraged) of approximately 175 city blocks. Pairing the initiative with a large monthly event, such as First Thursdays, ensures an existing platform for participation, reduces the potential opposition, and allows the initiative to expand in iterations. Both the complete and the discouraged-use zones are surrounded by major municipal roads which allow for traffic to flow around the area and ease traffic congestion. By ensuring that there are viable alternatives for private vehicle owners, such as accessible public transportation, Park&Rides, safe cycle infrastructure, carpooling, and biking, through collaborations with established organizations, the community can actively participate and private vehicle use can be reduced. Incentives to encourage civic engagement include working with local businesses and creating social media campaigns to create deals and engage with the community. Through the coordination of efforts and substantial planning, the Car-Free Day in Cape Town can be highly successful, proving the power of collective civic action.

# Authorship

Every member of the IQP team participated in producing all sections of the report and conducting methods. Each section was a collaborative effort as all members contributed equally to the writing, editing, and formatting of the report. Conflicting topics and ideas that came up during the drafting or editing process were talked about and resolved during meetings. When editing, every member read through each section and noted changes. We discussed final edits for each submission in order to create a report with a unified voice.

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# Introduction

Two decades after the end of the apartheid government, Cape Town remains segregated along racial and economic lines. The Group Areas Act of 1950 forced the relocation of blacks, coloureds, and Indians to the outskirts of all major South African cities, formalizing the segregation of populations initiated under colonial rule (Abdulla, 2017). In Cape Town today, the legacy of apartheid spatial planning is evident in housing and living conditions. Well-serviced and secure areas in the inner city, on the coastline, and close to Table Mountain are mostly inhabited by white people and those with high household incomes (Frith, 2013; Babarinde, 2009). As a result of land and urban development patterns caused by spatial planning, 25% of the City of Cape Town's economic activity takes place within the central business district (CBD), although it accounts for only 0.4% of the Cape Town Metropolitan geographic area (City Center Improvement District, 2017). People with lower economic status, including the majority of South Africa's black population, still live in areas on the outskirts of the city, such as the low-income townships of Mitchells Plain, Langa, and Gugulethu.

Given the centralization of economic activity within the city, people living on the city outskirts spend significant time and money on daily travel. In Cape Town, 95% of the people using public transportation to commute to work are from the low- to low-middle income brackets (Cape Town Transportation and Urban Development Authority, 2016). The weekly cost to commute from low-income neighborhoods, such as Langa, to the city center by the Metrorail costs 48.00 ZAR (3.50 USD), accounting for, on average, 20% of weekly wages earned by low-skilled workers (Metrorail, 2017; Clark & Crous, 2002; Western Cape Government, 2016). Given concerns of safety on the trains, and due to their added convenience, most people commute using buses, taxis, or private vehicles (Cape Town Transportation and Urban Development Authority, 2016). Given a growing middle class, people are increasingly owning private vehicles, resulting in significant congestion within the city. Low-income populations dependent on ill functioning and costly public transportation in Cape Town are limited in terms of opportunities and resources, leaving them excluded from economic prospects and creating a social divide between private vehicle owners and public transportation users.

In an effort to challenge the legacy of spatial apartheid, the non-profit organization Open Streets Cape Town (OSCT) aims to create opportunities for the diverse residents of Cape Town to engage with one another in public spaces. The organization's main initiative for civic engagement and social connection are Open Streets Days (Open Streets Cape Town, 2017). During Open Streets Days, a portion of a street within select neighborhoods is closed off to vehicular traffic to allow community residents and others from outside the community to collectively enjoy the street space. Various social activities are planned to make the day a fun event for all. In an effort to further expand this initiative, OSCT aims to explore the possibility of launching a Car-Free Day within the City of Cape Town.

A Car-Free Day entails the reduction of private vehicles within a city space to allow for public transportation, cycling, and walking. Car-Free initiatives have been implemented in major cities around the world, including Paris-France, Madrid-Spain, Gurgaon-India, and Sandton-South Africa. These initiatives have used the Car-Free approach to combat rising air pollution, traffic congestion, as well as community segregation. Cities apply different Car-Free Day initiatives that vary depending on the existing infrastructure and goals. In Paris-France in

2017, the goal was to reduce air pollution. Everything but public transportation and emergency vehicles were banned from the 105 km² (40 mi²) area (Wolfrom, 2017). Madrid-Spain in 2015, also to lessen air pollution, fined unauthorized cars entering the area (O'Sullivan, 2014). Gurgaon-India, in an effort to reduce congestion, took a unique approach to limiting car traffic by banning street parking in four of the city's most congested areas (Choudhry, 2015; Kohli, 2015). In Sandton-South Africa, the EcoMobility Festival operated for a month and encouraged private vehicle owners to find different ways to get around the city to address rising congestion and bridge the social divides caused by spatial apartheid (EcoMobility, 2015). These examples reveal the unique and varied ways that Car-Free Days can be implemented and inform how a Car-Free Day might be implemented in Cape Town.

The goal of this project was to help OSCT formulate options for a Car-Free Day in the Cape Town central business district (CBD) in an effort to bring the community together while addressing various environmental and social factors. To accomplish this, we discussed possible options with relevant experts and stakeholders, evaluated public acceptance of a Car-Free Day, and determined both feasible options and the necessary resources required for a Car-Free Day in Cape Town.

# Background

The dependence on private vehicle transportation in Cape Town, resulting from colonial and apartheid era city planning and government policies that fostered the economic prosperity of select population sectors, and current limitations in public transportation, has contributed to social exclusion (Hitge, 2017). Social exclusion refers to the lack of opportunities to participate in social activities including education, employment, and recreation (Litman, 2003). In Cape Town, low-income, black and coloured populations have become socially marginalized because of transportation infrastructure and efforts to address this need to be considered (Dimitrov, 2010).

## A Legacy of City Planning and Government Policies Limiting Economic Prosperity to Certain Social Sectors

South Africa's colonial and apartheid policies of social segregation have left a legacy of social divisions. This is nowhere more evident than in Cape Town, where high-income white families reside in economically prosperous areas of the city (or in surrounding neighborhoods), while low-income black and coloured families live in neighborhoods on the city outskirts (Turok, 2012). Using census data from 2001 and 2011, Adrian Frith produced an interactive dot map of racial spread in Cape Town. The map, see Figure 1, with each dot representing 50 people, reveals that over the period of a decade, the white minority remained entrenched in the more affluent and commercially viable areas, with minimal economic and racial integration. Given the centralization of economic activity within the city, black and coloured people living on the city outskirts continue to spend significant time and money on daily travel (Cape Town Transportation and Urban Development Authority, 2016). As most cannot afford private vehicles, they are dependent on the public transportation system.

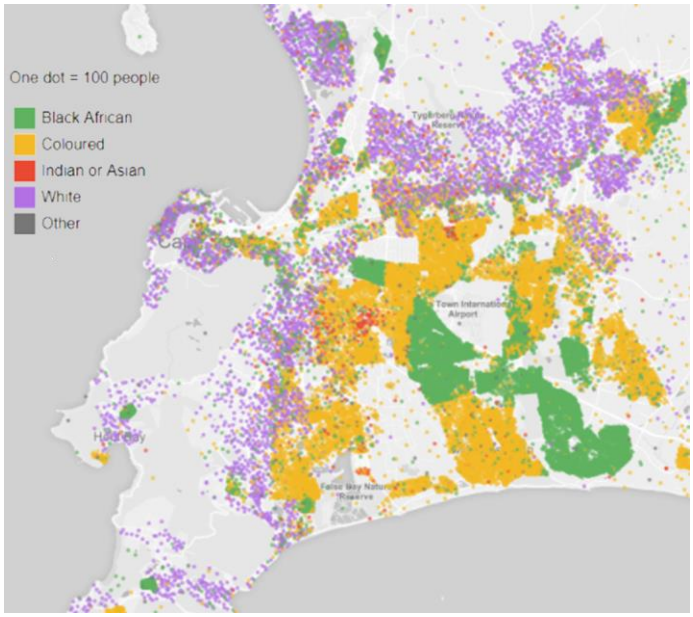


Figure 1: Population Density Categorized by Race in Cape Town (Frith, 2013)

# Current Limitations in the Public Transportation Sector

After the 2015 Congestion Summit in Cape Town, a growing need for viable public transportation was identified. Public transportation in Cape Town is comprised of three main sectors: trains operated by Metrorail, buses either Golden Arrow, MyCiTi, and Sibanye, and the minibus taxi industry. As highlighted in Table 1, showing cost, ridership, and current infrastructural concerns, while heavily used, each sector is facing significant fundamental challenges. Trains provide the cheapest form of transport from Mitchells Plain, a large township 32km east of Cape Town, at 12.50 ZAR (approximately 1 USD) for a one-way trip. However, trains have earned a reputation for not being dependable (Future Cape Town, 2017), and having significant crime and safety concerns (Future Cape Town, 2013). Buses are more dependable, but riders share similar safety concerns (GroundUp, 2012) and bus travel is limited by existing traffic congestion despite designated bus lanes on major highway routes into town. In addition, bus routes are limited within communities, offering only a few designated major routes (see Figure 2). Minibus taxis provide greater entry into communities and are significantly cheaper than other public transportation options, but neither routes nor schedules are established, and the private establishment is poorly regulated (Eichhorn, 2014). Consequently, minibus taxis are widely perceived as dangerous and chaotic because of the risky choices their drivers make on the roads, and the uncertainty of minibus taxi services has created a negative stigma around this informally run transportation service. Fear, inconsistent services, and high costs associated with public transportation negatively affect usage levels, and has resulted in a shift towards private vehicle use among those who have the choice (Cozens et al., 2004).

| Modes of Public Transportation | Cost Per Single Trip From Mitchells Plain to Civic Center | Ridership | Current Infrastructure Issues |
|---|---|---|---|
| **Trains (Metrorail)** | 12.50 ZAR (0.91 USD) if purchasing single pass, 7.28 ZAR (0.53 USD) for weekly pass, 5.20 ZAR (0.38 USD) for monthly pass (Metrorail, 2017) | 454,000 passenger trips (TDA, 2016) | Only 43% of trains are on time and at least 11% of trains are cancelled every day (Future Cape Town, 2017). |
| **MyCiTi, Golden Arrow, Sibanye Bus systems** | 25.80 ZAR (1.88 USD) (MyCiTi, 2017) | 250,000 daily riders (TDA, 2016) | Lack of dedicated lanes, expensive fare (Goldwyn, 2013) |
| **Minibus Taxi** | 10-15 ZAR* (1.18-1.77 USD) | 300,000+ daily riders (TDA, 2016) | Overcrowding and safety (Cape Town Safety, 2017) |

Table 1: Public Transportation Options Available in Cape Town, with Cost Estimates Provided for Travel from Mitchells Plain to Cape Town, Ridership, and Limitations (* = Approximation Based off Interviews with Consumers)


Figure 2: MyCiTi Bus Routes in the Cape Town Central Business District and the Immediate Surrounding Neighborhoods (Future Cape Town, 2014)

As shown in Figure 3, private vehicle use accounted for 53% of transportation trips (Cape Town Transportation and Urban Development Authority, 2016). Within Cape Town, private vehicle ownership has continued to increase by 4% each year (City of Cape Town, 2017). Increases in private vehicle use have caused congestion, expanded travel times, and contributed to poor air quality (Ranko & Bolaane, 2011). In 2013, Cape Town was ranked the most congested city in South Africa. During peak commute hours, congestion can add up to 42 minutes per commute (TomTom, 2016). Estimates indicate that the average South African can spend almost 7,100 ZAR (516 USD) and almost ten days per year sitting in traffic (City of Cape Town, 2015). Private vehicles also account for 30% of total greenhouse gases in Cape Town (Western Cape Government, 2013). Based on the World Health Organization's 2014 study on world health statistics, South Africa's annual mean level of fine particulate matter (e.g. $PM_{2.5}$ and $PM_{10}$) in urban areas was 31.3 μg/m³, over three times that in the United States of America (8.4 μg/m³) and just over half that of China (59.5 μg/m³). With a mean level of fine particulate matter of 31.3 μg/m³, South Africa's air introduces a 12.5% increased risk of all-cause mortality, 18.8% increase in cardiopulmonary mortality risk, and a 25.0% increase in lung cancer mortality risk for its residents.

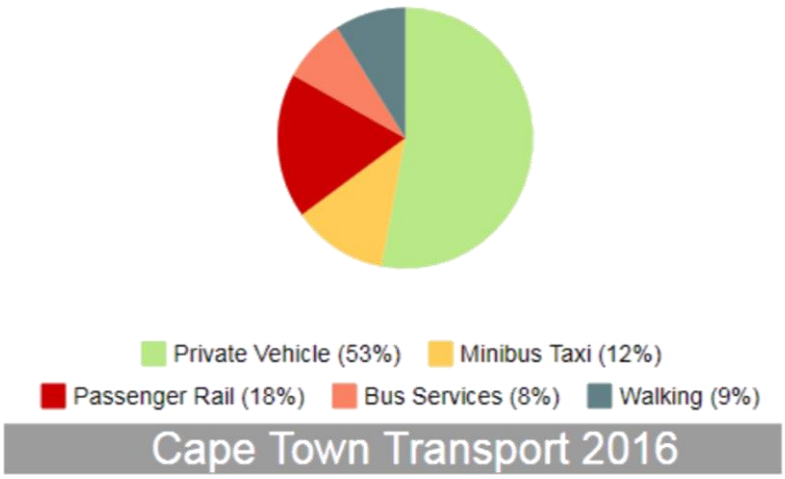


Figure 3: Cape Town Transportation use by Residents (Cape Town Transportation and Urban Development Authority, 2016)

Furthermore, with the rise of private motorized vehicles, many residents are deterred from using more environmentally friendly forms of transport, such as walking or cycling, because of the inherent safety risks imposed by motorized forms of transport. Vehicles often drive above the speed limit and do not follow traffic regulations. When walking, residents do not have the right of way, and drivers are aggressive at street crossings (Arrive Alive, 2017). Private vehicle owners also park on sidewalks and in walkways, obstructing foot traffic. Cyclists are hindered by motor vehicles that do not honor bike lanes. In 2013, 746 cycling accidents and six cyclist deaths were reported to the South African Police Service (Bikers United, 2013). With fewer private vehicles on the road, cyclists would be able to move around the area without having to worry as much about being hit. These safety and security concerns and infrastructural limitations often lead residents to choose private vehicles over more sustainable forms of transport.

## Car-Free Day: Addressing Rising Private Motor Vehicle Dependency

Car-Free initiatives have been implemented worldwide in an effort to reduce private vehicle use, and related air pollution and traffic congestion. Car-Free Days are held in all different parts of the world, but each city has unique reasons for implementing the day based upon conditions specific to the area. Figure 4 shows current Car-Free initiatives around the world. In 2017, over 1,000 cities around the world participated by hosting Car-Free initiatives (World Carfree Network, 2017). The World Carfree Network describes Car-Free Days as “the perfect time to take the heat off the planet, and put it on city planners and politicians to give priority to cycling, walking and public transport, instead of to the automobile” (World Carfree Network, 2014).

Figure 4: Map of Cities Participating in European Mobility Week and World Car-Free Day (EMW, 2017)

As Car-Free initiatives limit the number of private vehicles on the roads, harmful vehicle emissions are reduced, and air quality is drastically improved on the day of the event (McKibbin, 2014). One Car-Free Day that focused on mitigating pollution occurred in Paris-France. In 2015, the first Car-Free Day in Paris was implemented as an emergency response to hazardous air pollution levels (Paris Sans Voiture, 2017). Certain areas in the center of Paris were completely closed off to private vehicles and only allowed pedestrians and cyclists to enter. In the areas where cars were not banned, the people were encouraged to still leave their cars at home (see Figure 5). In 2017, a 40% drop in air pollution levels were documented in the city on the day of the initiative (Airparif, 2017). Air pollution levels continued to stay below average for a few weeks following the Car-Free Day (Airparif, 2017).


Figure 5: Map of the Car-Free Zones during the 2015 Paris Car-Free Day (Chrisafis, 2015)

Car-Free Days have also shown positive temporary effects on an area's traffic congestion. During a Car-Free Day in Gurgaon-India, the number of private vehicles on the road was reduced by banning parking in certain areas to combat rising congestion due to increasing car ownership in the city (NDTV, 2015). People were encouraged to leave their car at home, but entrance blockades were not enforced, and private vehicles were still allowed. Although driving was not banned, there were nearly 10,000 fewer private vehicles, a 25% decrease in typical private vehicle traffic (Choudhry, 2015). Additionally, public transportation during the day increased dramatically with public shuttles reporting 3,198 riders on the day of the event, 50% more than usual, and Rapid Metro experiencing a 10% increase in ridership (Kohli, 2015). Given the success of the first Car-Free Day, the initiative has been repeated every Tuesday thereafter.

In settings dependent on private vehicle use, with limited alternative transport options, Car-Free initiatives also address social inequality related to the exclusion of low-income or disabled groups (EcoMobility, 2015). A Car-Free Day has the potential to address social exclusion caused by transportation inequities. It can also provide people with the opportunity to interact with each other and enjoy their streets in a different way. Past Car-Free Days, highlighting the importance of optimizing public and non-motorized transport and reducing private vehicle usage in an effort to create social inclusiveness, have also provided opportunities for the community to come together. For example, during the EcoMobility Festival in Sandton-South Africa in 2015, private vehicles were not allowed in certain areas and public transportation was expanded and made free. Freedom Ride was held on a Sunday morning of the month and gathered 5,000 cyclists to enjoy nearly 30 km of streets for cycling. A Road Safety Family Day and Sporting Weekend encouraged people to use the streets in unique ways by picnicking, dancing, and playing. People were also able to experience new ways to get around the business district while interacting with others (EcoMobility, 2015).

## Exploring the Possibility of a Car-Free Day: A New Open Streets Cape Town Initiative

A Car-Free Day in Cape Town could potentially address the environmental and social consequences of a city heavily dependent on private motor vehicle transport. Open Streets Cape Town (OSCT), a community-driven organization that aims to create safer and more inclusive streets in South Africa, is motivated to explore the possibility of a Car-Free Day in Cape Town. OSCT became a registered nonprofit organization in 2013 when a group of volunteers set out to answer the questions "How do we transform the function and perception of streets?" and "How can we make communities 'street-minded'?" Open Streets Cape Town consists of artists, urban designers and planners, entrepreneurs, writers, and many others who use their skills to spread ideas through many different social circles. This diverse group of professionals also works to get various community members of all different socio-economic backgrounds to collaborate and exchange ideas. The organization aims to make streets spaces where people can come together. They began to center their research and campaigns around ways to bridge the physical and socio-economic gap that is present within Cape Town (Open Streets Cape Town, 2017).

Open Streets Cape Town created their first series of initiatives, Open Streets Days, in 2013. On these days, the City of Cape Town authorizes select streets to be temporarily closed to vehicle traffic. Activities are hosted in the streets (e.g., workshops, games, art exhibits), and they become platforms for experience and expression. Support from local artists, businesses, and community members make the streets come alive. In 2016, the Open Streets Day in Mitchells Plain hosted "thousands of people—of all races from all over" (Project for Public Spaces, 2016). The 2016-2017 Open Streets Days were hosted in Langa, Belville, the City Center, and Mitchells

Plain. Through an increase in Open Street Day participation, OSCT believes social integration in public spaces will create a more cohesive and collaborative Cape Town.

Open Streets Cape Town is interested in hosting a Car-Free Day for Transport Month 2018 in Cape Town or a nearby central business district. This would take the Open Streets Day idea to another level. OSCT hopes to create a more sustainable city while also bridging socio-economic divides. A Car-Free Day has the potential to reduce social exclusion by highlighting the limitations of the existing public transportation infrastructure and bring people together through civic engagement and participation in the initiative. Furthermore, by promoting more sustainable modes of transportation such as the commuter rail, MyCiTi bus systems, minibus taxis, cycling, carpooling, or walking, OSCT can begin to address traffic congestion and environmental issues while creating new experiences and interactions between residents. The perception of a city can be reinvented as a place that values social cohesion (UCLA Center for Health Advancement, 2016).

# Methods

The goal of this project was to help OSCT formulate options for a Car-Free Day in the Cape Town central business district (CBD), or a nearby CBD such as Stellenbosch, in an effort to bring the community together while addressing various environmental and social factors. The objectives we followed to accomplish this were:

1. Determined feasible options and the necessary resources required
2. Documented relevant expert and stakeholder opinions on the implementation of a Car-Free Day in Cape Town and Stellenbosch
3. Assessed public acceptance of a Car-Free Day

## Objective 1: Determined Feasible Options and the Necessary Resources Required

### Archival Research

We conducted archival research on past Car-Free Days to understand how other initiatives were implemented. Car-Free Days are not identical and vary depending on the context of the urban area. We identified four examples of Car-Free initiatives that used unique implementation methods that would provide some foundational information on what a Car-Free Day could look like in Cape Town. These important examples include Paris-France, Madrid-Spain, Sandton-South Africa, and Gurgaon-India with a breakdown of their unique criteria explained in Table 2. To highlight differences in implementation, we analyzed several Car-Free initiatives based on: a) the size of the Car-Free zone, b) the types of transportation allowed in the zone, c) enforcement of the Car-Free initiative (both governmental and civilian enforcement strategies), d) reported benefits of the Car-Free initiative (i.e., environmental, social), e) oppositions to the initiative, and f) how each initiative was marketed and what ways the city was able to encourage various stakeholders to become involved. These Car-Free initiatives, in conjunction with the analysis of expert interviews and insights and perspectives from the public, were used to inform specific aspects of implementing a Car-Free Day in Cape Town.

| City | Unique Features of each Car-Free Day |
|---|---|
| **Paris, France** | Large area where private vehicles were banned |
| | Large road surrounding the city left open |
| | Encouraged cycling and walking |
| **Madrid, Spain** | Areas where private vehicles were banned |
| | Allowed through-traffic on major bisecting roads |
| | Car-Free zones activated according to pollution levels |
| **Gurgaon, India** | Banned parking in congested areas |
| | Encouraged people to not use their car |
| | Increased public transport availability and hours |
| **Sandton, South Africa** | Areas where private vehicles were banned |
| | Loops dedicated to public transportation |
| | Areas where only cyclists and pedestrians are allowed |
| | Increased public transportation availability |

Table 2: Unique Features of Car-Free Days in Paris, Madrid, Gurgaon, and Sandton

# Objective 2: Documented Relevant Expert and Stakeholder Opinions on the Implementation of a Car-Free Day in Cape Town and Stellenbosch

## Semi-Structured Interviews with Experts and Stakeholders

To formulate feasible options and determine the resources that would be necessary to implement a Car-Free Day in Cape Town or Stellenbosch, we conducted semi-structured interviews with relevant experts in Cape Town and Stellenbosch. These experts included representatives from organizations that had an interest in the initiative and could possibly contribute to the success of the day (e.g., bike advocacy groups, urban planners, transportation engineers, and carpooling platforms). All experts provided insight on current transportation (private, public, and non-motorized) infrastructure as well as some context on the unique economic and social factors in and around Cape Town and Stellenbosch. Through our experts' combined understanding of the social context of both central business districts, and their knowledge of their unique field, we gained quality insights into how to create viable options for both areas. Their cooperation allowed us to create a list of ideas and resources necessary to implement and incentivize a Car-Free Day successfully. Experts also identified the various challenges that would need to be addressed in order to implement a Car-Free Day in Cape Town and Stellenbosch. A list of experts interviewed is included in Table 3.

Expert and Stakeholder List

| Organization | Contact Name | Description/ Position | Contact information |
|---|---|---|---|
| Qhubeka | Andrew Wheeldon | Cycling Organization | andrew@bicyclecities.info<br>+27 0825 989 178 |
| Future Cape Town | Rashiq Fataar | Sustainability/Transportation Organization | rfataar@futurecapetown.com |
| Accelerate Cape Town | Nikky Dowding | Sustainability/Transportation Organization | nikky@acceleratecapetown.com |
| Gerhard Hitge | Gerhard Hitge | Transportation Engineer | gerhardhitge@mweb.co.za |
| UPCycles | Jared Chaitowitz | Bike Share Organization | hello@upcycles.co.za<br>+27 076 135 2223 |
| City Green Print | Elzette Henshilwood | Urban Planner | elzette@citygreenprint.co.za<br>+27 083 2312600 |
| JumpIn Rides | Pauline Du Paty | Carpooling Platform | pauline@jumpinrides.com<br>+27 714 200 639 |
| University of Cape Town | Roger Behrens | Transportation Engineer | roger.behrens@uct.ac.za<br>+27 021 650 4757 |
| Bicycle South | Lebogang Mokwena | Cycling Instructor | lebogang.mokwena@gmail.com |
| Deloitte UK | Catherine Cartwright | Urban Advocate | catherinenicks1@gmail.com<br>+27 72 6011 013 |
| University of Stellenbosch | Reginald Kgwedi | Transportation Logistics Professor | kgwedi@sun.ac.za |
| Cape Town Central City Improvement District | Muneeb Hendricks | City Improvement Services | mo@capetowncccid.org<br>+27 021 286 0834 |
| UGoMyWay | Chris Megan | Carpooling Platform | chris.megan@ugomyway.com<br>+27 021 761 4384 |
| Where is My Transport | Bianca Ryseck | Organization that Collects Informally Run Public Transport Data | bianca@whereismytransport.com<br>+44 7928 936243 |
| University of Cape Town | Sean Cooke | PHD Student at the University of Cape Town | ckxsea001@myuct.ac.za |

Table 3: Stakeholder Contact Information

All interviewees provided verbal consent prior to the interview. To begin the interview, we explained the purpose of the proposal and explained why we valued their specific insight. We then asked questions to gather data about:

- perceptions of public transportation
- perceptions of a Car-Free Day
- potential oppositions to initiative
- organizational interest in contributing to a Car-Free Day (e.g., providing volunteers, spreading the word)
- ideas to incentivize and motivate people to utilize alternate modes of transport
- feasibility of different Car-Free Day options
- ideas to implement civil enforcement on a Car-Free Day

Interviews were audio recorded and field notes were taken. At least two team members were present at each interview with one individual asking questions and the other taking notes. From the audio recording and field book, interviews were transcribed into a Word document. The interviews were analyzed for themes regarding feasible options for a Car-Free Day, perceptions of a Car-Free Day, incentives to encourage participation in a Car-Free Day, methods to utilize civil enforcement, and contributions organizations were willing to make for a Car-Free Day initiative. A summary and reflection of the interview was created upon the request of our sponsor.

# Objective 3: Assessed Public Acceptance of a Car-Free Day

## Semi-Structured Interviews

To gather public stakeholder perspectives, we conducted semi-structured interviews with residents in both the Cape Town CBD and the Stellenbosch CBD. Efforts to gain the perspectives from a purposive (yet convenience sample) of the general public allowed for a set of standard questions to be asked of all participants with the freedom to probe answers and ask additional questions related to the topic (Cohen & Crabtree, 2006). Prior to initiating any interview, we completed a verbal consent process, during which we explained who we are and what our project aimed to accomplish. We described a Car-Free Day and showed ideas for the proposed areas. We also asked questions regarding the reasons for their interest in a Car-Free Day, motivations to participate, and interest in incentives (e.g., ridership discount, increase in bike share availability) to explore what would encourage participation on this day. Questions regarding civil enforcement strategies were also asked.

To attain broad perspectives from individuals of different socio-economic backgrounds who use different methods of transportation (e.g., public transportation, private cars, non-motorized), we interviewed residents in various public places within the Cape Town CBD and the Stellenbosch CBD. This included restaurants and cafes, businesses, and public transportation stops. Interviews were also conducted at random by approaching people while walking throughout the two CBDs. We also varied the times in which the interviews were conducted (morning, lunchtime, afternoon). Two members of the team conducted each interview, with one individual asking questions and probing for additional insights and another taking notes in a field book. Interview notes were analyzed for themes.

# Findings

## Implementing a Feasible Car-Free Day in Cape Town

Upon completion of our archival research, expert interviews, and public interviews, we identified themes that will inform the implementation of a Car-Free Day in Cape Town. For the initiative to prove successful, there needs to be a consideration of ways to enhance community participation that are not purely focused on removing private vehicles, such as pairing with another established event, ensuring adequate alternative transportation is available, establishing a traffic management plan, investing heavily in pre-event marketing, developing incentives to motivate participation, considering the ramifications of a potential failure, and considering locations other than the Cape Town CBD. Each finding is further explored below.

## Pair with a Large Event to Help Encourage a Change in Travel Behavior

Pairing with an established large-scale event is likely to enhance the success of a Car-Free Day as people are already united around a single concern or issue. The 2010 FIFA World Cup was used by many of the experts interviewed as an example of how events can create an increased use of public transportation and non-motorized transport in Cape Town. University of Cape Town Professor, Roger Behrens, noted the increased use of "the fan mile," a pedestrianized route connecting the Cape Town rail station to the World Cup Soccer Stadium in Green Point. He explained that, "The number of people using the fan mile far exceeded the number of seats in the stadium" (R. Behrens, personal communication, November 3, 2017). Gerhard Hitge, a transportation engineer within Cape Town, also discussed how the 2010 FIFA World Cup forced a large amount of road closures, but with little opposition reported (personal communication, October 31, 2017). The 2017 Paris-France Car-Free Day was held during Fashion Week, complementing the Car-Free Day initiative with its existing established community following and participation. Similarly, during the EcoMobility Festival held in Sandton-South Africa, an associated festival became the reason for the community to come together. Large bike rides, family days, and sport weekends were held in the streets and an EcoMobility Block Party was held as a street carnival to celebrate urban mobility. Exhibitions about urban mobility were held to attract attention to the CBD and gave experts from around the world an opportunity to speak on ecomobility and sustainable public transportation (IOL, 2015). These events allowed for all types of stakeholders within the community to become involved, including the private sector, universities, non-governmental organizations, and cycle groups (EcoMobility, 2015).

## Ensure Viable Alternatives to Private Automobiles in Cape Town

In Cape Town, the failing public transport system is acknowledged by all experts. Additionally, our public interviews reflected a general negative perception of public transportation in Cape Town. Many people agreed that the system needs to be improved to create a successful Car-Free Day. Elzette Henshilwood, an urban planner at City Green Print, shared similar thoughts about perceptions of public transportation in Cape Town, stating that

"the public transportation is not good enough, the taxis drive crazy, and the train is always late and there are issues of overcrowding. The chances of you being mugged to and from the station is also very high. That's what people are saying" (personal communication, November 1, 2017). Negative perceptions of the system persist. "People are scared. They don't know where to buy the tickets, what to do at the bus stops, they're anxious" noted spatial and transport economist at ModalEcon, Jacomien van der Merwe (personal communication, November 8, 2017).

A Car-Free Day is not possible without viable alternative options to private vehicle use. Chris Megan, the CEO of the carpooling platform uGoMyWay, noted that ostracizing private car users can have a negative impact on the success of the day if there are not sufficient, safe, and efficient options of transportation, stating "You can't punish one person when you are not providing an alternative. You can only do it when you have excellent public transport. That's the balance" (personal communication, November 14, 2017). Many experts agreed that the MyCiTi bus service area would need to be expanded to become a viable alternative mode of transport for a Car-Free Day to be successful. This could be through creating bigger fleets and having services that start earlier and end later during the initiative to prevent the system from becoming packed and making it worse than normal (J. van der Merwe, personal communication, November 8, 2017; E. Henshilwood, personal communication, November 1, 2017). During the EcoMobility Festival in Sandton-South Africa, public transportation options were greatly expanded with 150 new Metro buses servicing express and non-stop bus routes (EcoMobility, 2015).

Another effort to create more sustainable transportation alternatives is through revitalizing the city's current facilities. Gerhard Hitge, a transportation engineer in Cape Town, suggested revitalizing the current Park&Ride services within Cape Town, noting, "The facilities are underutilized" (personal communication, October 31, 2017). During the EcoMobility Festival in Sandton-South Africa, Park&Ride facilities were located on the outside of the zone and allowed for travel into the Car-Free area (EcoMobility, 2015). Utilizing the minibus taxi industry offers an efficient and low-cost option that also provides a good public-private partnership for the City of Cape Town (E. Henshilwood, personal communication, November 1, 2017; A. Wheeldon, personal communication, October 27, 2017; R. Kgwedi, personal communication, November 8, 2017). Multiple experts also suggested allocating certain spaces for additional parking outside of the Car-Free zone where people could be shuttled into the CBD (S. Cooke, personal communication, November 27, 2017; R. Behrens, personal communication, November 3, 2017). Sean Cooke commented on how the University of Cape Town was used as a place to park and be shuttled in by university buses during the 2010 World Cup, noting "The university operates 24 hours a day, 7 days a week, so you would just need to make sure there are enough car guards and buses" (S. Cooke, personal communication, November 27, 2017).

Within Cape Town, the informally run minibus taxi industry is the largest mode of shared public transportation (Ryseck, 2017). However, Bianca Ryseck, the Impact Evaluation Lead at WhereIsMyTransport, discussed the concerns that residents in Cape Town have about this informally run public transportation system. Information about routes, times, and costs are not easily accessible. In addition to these, Bianca Ryseck mentioned safety as a big concern, noting that people are concerned about the inconsistency in pick up times and locations of the routes of the minibus taxis, especially past dark. With the launch of their Cape Town Taxi Project, WhereIsMyTransport collected data from every minibus taxi route, including their stops, costs, and how frequently each route runs. This data is collected in the form of an Application Programming Interface (API), a tool to build an application (app) or website. However, the data is still underutilized, leaving potential for routes and accessibility of minibus taxis to be integrated into current information platforms. If this is accomplished, it could

increase the satisfaction of users and could lessen the negative stigma surrounding the industry. Bianca Ryseck believes this collected data has the potential to contribute to the success of the Car-Free Day because having publicly available data on the minibus taxis schedules should help make taking a minibus taxi a more attractive option. She noted that creating this platform is important because a person's "first jump is always the scariest" (B. Ryseck, personal communication, November 16, 2017).

Carpooling was also identified as a viable option to reduce private vehicle use with increased awareness and encouragement of the use of established ride sharing apps such as JumpIn Rides and uGoMyWay. Chris Megan of uGoMyWay pointed out that "the moment you open up a car to say that it could have more people in it, in many ways you are driving the reduction in private cars on the road" (personal communication, November 14, 2017). However, government regulations in Cape Town limit the carpooling industry from moving forward and being promoted by the city. While Uber is an e-hailing taxi company used to create journeys, carpooling is a way to share a journey that is going to happen anyway. Chris Megan stated that "Uber has slowed down in some ways the ability of governments to endorse carpooling because they [the state] don't know how to differentiate between the two" (personal communication, November 14, 2017). Though not a government-regulated form of transport, carpooling was the most popular alternative form of transport among private vehicle owners interviewed in both Cape Town and Stellenbosch due to its safety, convenience, and familiarity.

In terms of non-motorized transportation options within Cape Town, less than 1% of the share of mobility is by bicycle (A. Wheeldon, personal communication, October 27, 2017). The current infrastructure for cycling in Cape Town is lacking. With few bike lanes, the large number of private vehicles that park in designated bike lanes, and the lack of adequate bike racks throughout the city, there is potential to do more to encourage cycling infrastructure (L. Mokwena, personal communication, November 9, 2017; C. Cartwright, personal communication, November 3, 2017). When looking at the Car-Free Day in Gurgaon-India, bicycle rental stations were positioned outside of metro stations to provide people with transportation into the zone (Choudhry, 2015). Pop-up bicycle lanes were also created during the EcoMobility Festival in Sandton-South Africa (EcoMobility, 2015). Our data suggests that increasing cycling infrastructure and bicycle availability can lead to a more successful Car-Free Day. When interviewing residents of Stellenbosch, non-motorized transport was favored as the primary alternative mode of transportation.

While these are all viable options, safety remains a primary concern preventing people from utilizing public and alternative modes of transport. Andrew Wheeldon, consultant of the nonprofit organization, Qhubeka bikes, notes, "Many people get mugged and get their wallets, phones, and bikes stolen" (personal communication, October 27, 2017). Additionally, residents do not always feel comfortable waiting at stops or walking to and from locations because of high rates of crime, such as petty theft and opportunistic crimes (Expat Arrivals, 2017). This factor can limit public transportation use within Cape Town, and bad experiences can deter future use. However, encouraging an increase in the use of alternative transportation has the potential to create safer spaces. Security will need to be increased more in the area to guarantee this and help people feel safer. Muneeb Hendricks, of the Cape Town Central City Improvement District (CCID), notes that it is important to "deploy additional people to the public transportation systems on that day and have more police monitoring your MyCiTi bus stations" in order for the residents to feel safer when using alternative modes of travel (personal communication, November 9, 2017).

Looking toward the future of sustainable transport in Cape Town, a large part of transforming travel behavior is keeping the momentum going and relevant to everyday life. The Car-Free Day has the potential for sustainable transportation organizations to hold workshops and demonstrations to educate the public on their service. Raising awareness and creating ways for people to learn and feel comfortable with alternatives can lead to the city's ongoing transportation development efforts, as Gerhard Hitge suggested, "the fact that [the City of Cape Town] agreed to buy the rail system from the national government is a big political statement. [The City is] saying they really care" (personal communication, October 31, 2017).

## Have a Traffic Management Plan to Minimize Congestion in and Around the Zone

In terms of the logistics of implementing a Car-Free Day, urbanists and engineers agree that there must be a plan in terms of alleviating the congestion that is created on the roads surrounding the zone. Sean Cooke noted that it will be difficult to gain the support of the City of Cape Town without a full transport plan because during a Car-Free Day, about 250,000 people would have to get into the city without cars (personal communication, November 27, 2017). Cities that have implemented Car-Free Days have used different strategies to make sure concerns about traffic were addressed. Madrid-Spain left major through-routes and enclosing streets around the border open, allowing traffic to flow through the zone to avoid traffic jams (O'Sullivan, 2014). During the EcoMobility Festival in Sandton-South Africa, the city designed an explicit traffic management plan to minimize the impact of disruptions and to keep the public informed about alternatives to private vehicle use (see Figure 6) (Brand South Africa, 2015). Similar to Madrid-Spain, Sandton-South Africa allowed some one-way streets to be open to private automobile use. Around the zone, as shown in pink, a public transport loop was created and was open to all vehicles to allow for traffic flow. Groups of officers were utilized at all junctions to ensure safety of pedestrians and efficient traffic flow (EcoMobility, 2015).

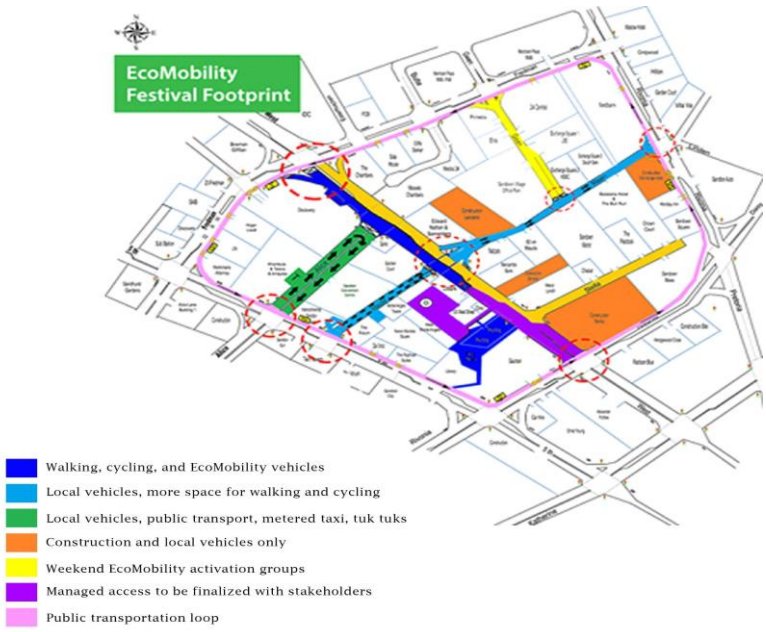


Figure 6: Sandton-South Africa EcoMobility Festival Traffic Management Plan (Brand South Africa, 2015)

In all Car-Free initiatives examined for this project, police and government vehicles were allowed within the zone. University of Cape Town professor, Roger Behrens, mentioned that "presumably you would allow emergency vehicles and police and waste collection etc., during a weekday" (personal communication, November 3, 2017). During the Car-Free Day in Paris-France, public transportation, emergency vehicles, taxis, construction and delivery vehicles were still allowed on the roads. However, these vehicles had to follow a strict 30 km/h speed limit within the Car-Free zone. Allowing emergency vehicles is imperative for the safety of commuters and pedestrians that are in and around the area. Sean Cooke also expressed concerns about incorporating the travel patterns of residents and negotiating with those that live within the Car-Free zone in order to reduce confusion and keep people informed (personal communication, November 27, 2017). Residents living inside the Car-Free zone in Madrid-Spain and Paris-France were given special permission to drive in the zone (Ayuntamiento de Madrid, 2016; Paris Sans Voiture, 2017).

## Incentivizing Participation

A communication strategy and marketing campaign is essential to encourage participation. Gerhard Hitge explained that OSCT must "tell people why [they're] doing it. Without a purpose, it's just a disruptive event" (personal communication, October 31, 2017). Experts also believed the campaign should target the private vehicle owners (R. Fataar, personal communication, October 31, 2017; R. Behrens, personal communication, November 3, 2017). When asked about this, Lebogang Mokwena, a cycling instructor at Bicycle South, stated that "there is a lack of imaginative capacity to sort of imagine the possibility even of not using their own private vehicles. I hope it's [the Car-Free Day] a demonstration for creating social spaces of mutual encounter across different racial and economic backgrounds" (personal communication, November 3, 2017). Gerhard Hitge also shared similar opinions, noting "It would be nice to show what a Car-Free Day would look like. Sketch that vision of what the streets would look like without cars" (personal communication, October 31, 2017). It is important for the initiative to continue to inspire creative solutions to the future of urban mobility in Cape Town, as "Initiatives like this can demonstrate how alternative modes of mobility can be fostered…we could drive the city toward a more intermodal mode of thinking of transportation" (L. Mokwena, personal communication, November 3, 2017).

To communicate the purpose of the day, big picture ideas should be marketed. Rashiq Fataar of Future Cape Town compared private vehicle use to the current water crisis. Many steps have to be taken to raise awareness of potential disaster in the future: "You have to culturally take people on a journey. You have to try Car-Free Day… it is one of those steps where you need to start showing people that things are going to change. There's going to be less parking, it's going to be more expensive. Even carbon taxes in the future" (R. Fataar, personal communication, October 31, 2017).

It is important to define the benefits to the participants of the Car-Free Day. When speaking with Elzette Henshilwood, she suggested using a campaign around congestion, as "People feel congestion and time" (personal communication, November 1, 2017). She also suggested marketing the day using the various monetary, social, and environmental benefits to different demographics, noting that "It's about enticing different mindsets" (personal communication, November 1, 2017). Professors of the University of Stellenbosch suggested creating examples of calculated savings and benefits to individuals. This could include the differences in fuel prices for single occupancy vehicles and carpooling, the number of calories you can burn from non-motorized transport, and the differences in travel time between the various modes of transport. Showing residents how a Car-Free Day can positively influence

their life is another way to encourage participation. Jacomien van der Merwe discussed how communicating about what people are contributing or causing is important because "people don't realize they are adding X amount of pollution to the environment" (personal communication, November 8, 2017; R. Kgwedi, personal communication, November 8, 2017). Lebogang Mokwena discussed ways to entice people about saving time. A lot of time can be saved from searching for a parking spot, noting "When you drive into the city, you are missing out on a lot during driving time" (personal communication, November 3, 2017). During Car-Free Days in Madrid-Spain, the city published a daily bulletin showing pollution levels in different districts based off of different measurements (Ozone, $NO_2$, and $PM_{10}$) with possible scores being categorized as: good, admissible, deficient, and bad. Statistics are displayed online and on streets, actively encouraging residents to improve the air in their districts by reducing their automobile usage (Ayuntamiento de Madrid, 2017).

To communicate the purpose of the day, all cities that hosted Car-Free Days used media to involve the community. One mode of media that can be utilized is the radio. When asked about marketing, Chris Megan suggested "CapeTalk owns two or three radio stations. They love promoting carpooling because more people are sitting in the cars and listening to the radio...but you don't have to spend money advertising with them. They are happy to just promote" (personal communication, November 14, 2017). Another marketing strategy involved billboards and circulating the information. During the EcoMobility Festival in Sandton-South Africa, the Car-Free Month was promoted by banners at motorways, in newspaper articles, on the radio, and on social media. Additionally, people were encouraged to get involved by participating in public debates on Twitter and Facebook. The City of Johannesburg, in support of the Sandton-South Africa initiative, also created a "Change the Way You Move" campaign. It asked people to leave their private vehicles at home to use public transportation, Park&Ride facilities, and to cycle and walk (EcoMobility, 2015).

Experts also recommended getting a large participation from sustainable transport organizations that are interested in becoming involved in the day. In preparation for the EcoMobility Festival, over 80 meetings were held with companies and organizations in Sandton-South Africa to spread the concept and identify trade-offs for all involved (EcoMobility, 2015). Andrew Wheeldon discussed how "All of the linked organizations [in Cape Town] speak to each other, and we have forums, and there's constant social media chit-chat going on" (personal communication, October 27, 2017). JumpIn Rides, uGoMyWay, Cape Town Central City Improvement District (CCID), and Bicycle South agreed to engage with the event on social media and mobilize their community following. From this, each organization has the power to participate in a social media campaign that is unique to their organization. For example, Pauline du Paty of JumpIn Rides expressed how the company is willing to create a customized event page on their website to provide their followers with a platform to create shared trips to the CBD (personal communication, November 2, 2017). Bicycle South also could create large community rides along the established commuter bike trails toward the CBD (A. Wheeldon, personal communication, October 27, 2017). Another way to incentivize the day is to get the carpooling business involved advertising the benefits of carpooling. Chris Megan suggested using a variety of parking schemes, such as preferential parking for High Occupancy Vehicle (HOV), or varied prices for parking within the zone based on number of people in the car (personal communication, November 14, 2017). Another stakeholder who can market and support the day externally is the City of Cape Town. Andrew Wheeldon discussed how "[Mayoral Committee Member for Transport & Urban Development] Brett Herron and Mayor Patricia de Lille have to be fully behind the event" (personal communication, October 27, 2017). This can be accomplished by mobilizing the community from the inside out, by "Getting all the advocate groups together and get them to promote this and then look toward the government"

(C. Megan, personal communication, November 14, 2017). The initiative can show the City of Cape Town that residents are interested in tackling travel behavior as a united front.

Another way to incentivize the Car-Free Day is to get businesses involved. During the Car-Free Day in Washington D.C., an online pledge was created to use an alternative mode of transport to get to work. In return, email confirmation codes sent to registered email addresses could be redeemed in restaurants for deals (CarFreeMetroDC, 2017). This provides incentives to participate. Through this idea, restaurants, businesses, and residents all could benefit. An increase in foot traffic and giving people an incentive to come to a restaurant and business can boost sales. Asking businesses to become involved with the marketing strategy and provide deals for people who utilized alternative modes can reward people who have made sustainable choices. In return, participating businesses can be advertised as sustainable.

Other experts also suggested to get buy-in from corporates in the Cape Town CBD to market to their employees. When speaking to Jacomien van der Merwe, she discussed a way to target corporates, "You need to go to the CEOs, the HRs, and say to them, this is going to happen in Transport Month of next year, these are the benefits, this is how it will improve X, Y, Z, and you need to get their buy-in, so they start encouraging their employees" (personal communication, November 8, 2017). Andrew Wheeldon of Qhubeka believes that corporations could encourage employees to give up parking spaces in return for spaces for bike racks, showers, and changing facilities. He suggested to "Ask [the company] to state just how much they would be prepared to do" (personal communication, October 27, 2017).

While getting corporations involved in this way can help support the day from a marketing standpoint, they also have the potential of funding the initiative. Rashiq Fataar discussed getting corporation buy-in to potentially fund the day, noting "if the private sector pays X amount of traffic officials to man a day like that, it is possible" (personal communication, October 31, 2017). Encouraging corporations to become partners or sponsors of the day can provide monetary and social benefits to the Car-Free Day. In return, the government has the potential to "reward and incentivize corporates who embrace green transport initiatives such as carpooling and NMT" (C. Megan, personal communication, November 14, 2017). This mutual support can create a positive relationship between employers, employees, and sustainable transport.

Another way to incentivize the day is to provide free or reduced-fare services for public transportation. During the EcoMobility Festival in Sandton-South Africa, 100 minibus taxis provided free services from the Park&Ride facilities. This became a viable alternative for private car users and created a large increase in community participation (EcoMobility, 2015). During the Paris-France Car-Free Day, public transportation was again made free for a few days (France 24, 2015). The MyCiTi BRT also has the potential to support a Car-Free Day by hosting a free or reduced ridership day.

## Expansion through Iterations

Experts noted the possibility of creating opposition of the initiative if it starts too large or is poorly executed. For instance, several experts suggested to get people more willing to participate in a Car-Free Day, the idea could be implemented slowly, such as closing a few streets at a time, and gradually build the event to a larger-scaled event (S. Cooke, personal communication, November 2017; M. Hendricks, personal communication, November 9, 2017; J. van der Merwe, personal communication, November 6, 2017). One rationale for starting small and over time building the event to be larger is that bad first impressions could reinforce existing behaviors rather than change them. Experts also noted that bad experiences using

public transportation can affect how people continue to think about it in the future (R. Behrens, personal communication, November 3, 2017). Sean Cooke expressed his concerns about this idea, noting how “A Car-Free Day is inherently a very aggressive move. There's a whole load of interim steps that you could turn to before that, if you're talking about reducing congestion [as the purpose of the initiative]. There's [even] congestion charging” (personal communication, November 27, 2017).

From the examined case studies, we found that many cities implemented an iterative approach. For example, during the first Car-Free Day in Paris-France in 2015, 30% of the city was closed down completely to private vehicle use, while other areas had discouraged use zones (France 24, 2015). The event was well received by the population, with many residents remarking that the first initiative was too small. In 2016, the Car-Free zone was expanded. In 2017, Mayor Hidalgo closed off almost the entire city to private vehicles for a total area of 105 $km^2$ (40 $mi^2$) (Paris Sans Voiture, 2017). During the Gurgaon-India Car-Free initiative, the first iteration only banned parking in select areas rather than shutting down entire sections of the city. Because the ban only applied to parking and not driving, private vehicle owners did not feel ostracized. The event was well received and has continued to occur every Tuesday since the initial initiative (Kohli, 2015).

An expansion approach can also be implemented in Cape Town. Through our research and discussions with experts, we identified several areas where a Car-Free initiative could be held within Cape Town. Within each of these proposed areas, an iterative approach could be used. For example, the restricted area could start small within the CBD and grow larger, or different regulations or restrictions could be implemented over time (e.g., no private vehicle use, discouraged vehicle use, limited parking approaches). Another idea to iteratively implement a Car-Free initiative in Cape Town could be working with local universities. Sean Cooke argued that one approach could be to “persuade the three biggest universities to go Car-Free for a day. Just block off the parking lots and get the students to make another plan” (personal communication, November 27, 2017). These smaller versions of Car-Free initiatives have the potential to be used as case studies within Cape Town to understand potential success and failures of the day.

## Opposition to Consider and Address

Many experts recognize the opposition that is likely from the private vehicle owners. During the Paris-France Car-Free Day, the most notable resistance came in the form of pro-car lobby groups and avid motorists on social media. These groups believed Parisian Mayor Anne Hidalgo was too extreme and working against the car industry (theSundaily, 2017). Others argued that the Car-Free Day reduced congestion is some areas, but caused more traffic jams in detours away from the Car-Free zone (Bonaventure, 2017). As seen in Paris, the “40 Million Motorists” association remarked on how an initiative like this is pointless if you create congestion outside the zone as a result of the Car-Free area (Willsher, 2016). This issue can be a result of an inefficient traffic management plan. Although Madrid-Spain’s Car-Free zones are widely accepted as an effective strategy to combat pollution and congestion in the City Center, a Car-Free Day in 2016 caused significant backlash from both public transportation users and private vehicle users. The city shut down most streets to all private vehicle traffic in the city center and surrounding areas, resulting in travel times being on average 89% longer than usual during peak hours (Olaya, 2016).

Depending on the proposed area and the time of the restrictions, Gerhard Hitge discussed how the biggest opposition from private vehicle owners will be the inconvenience to their schedules (personal communication, October 31, 2017). Muneeb Hendricks pointed out that "lots of people [private vehicle owners] live in the city and park in the city, if you are going to shut down these streets, how are people going to get home?" (personal communication, November 9, 2017). Reginald Kgwedi shared the idea of how people are hesitant because they do not see the immediate benefit, noting "In the long run, it's actually a benefit to them. They just don't see it yet" (personal communication, November 8, 2017). However, Rashiq Fataar, of Future Cape Town, identified this opposition as almost irrelevant, explaining "You have to piss off people to try things. People are opposed to everything" (personal communication, October 31, 2017).

Another potential opposition to consider is hindering businesses productivity. It is important to consider freight and that businesses can get their deliveries within the zone. As a possible alternative, Muneeb Hendricks of the Cape Town CCID mentioned that "there are cities where they have one truck as a delivery vehicle from one warehouse. All the companies have their deliveries come to that to warehouse, and only one truck is needed to make those deliveries instead of a million trucks. This is managed by the city, creates jobs, and reduces the number of vehicles" (personal communication, November 9, 2017). Many experts stated how businesses may reject the idea of the day because of the fear of losing profit when people cannot drive to the specific store. Yet, Andrew Wheeldon also discussed how the day has the potential to increase business productivity explaining that during the first Car-Free Day in Cape Town in 2003, businesses experienced an increase in foot traffic and people flocked to the shops because they were walking and could wander in and out of shops more freely (personal communication, October 27, 2017). One possible way to convince businesses that a Car-Free Day could be beneficial to them is to track foot traffic patterns and use estimated percentages of increases of people entering stores. Bianca Ryseck suggested that the technology used at WhereIsMyTransport could potentially support this type of initiative (personal communication, November 16, 2017).

Another opposition from business to consider is the exclusion of Uber and the private metered taxi services from the Car-Free Day. To combat this, Sean Cooke suggested incorporating these services by designating pick-up and drop-off areas for the day, noting that they could have the potential to ask users of the app to walk to specific spots to catch an Uber instead of being picked up within the middle of the CBD indicating that "Uber [could be] quite open. They are trying to be more progressive at the moment" (S. Cooke, personal communication, November 27, 2017). This type of pickup and drop-off for Uber and metered taxis is already incorporated in Cape Town, and designated pick up points and lanes can be found at the V&A Waterfront on the Uber app.

Another opposition from business to consider is the parking garages and parking lot owners that could lose business on this day. Depending on the level of enforcement for the Car-Free Day, repurposing these parking areas or increasing the parking charges can offset reduction in business on the Car-Free Day. When discussing this opposition with Bianca Ryseck, she suggested renting out the space and using it in a different way, noting that another way to use the space could be a temporary urban park or space for food vendors. She suggested creating new urban spaces for people during their lunch breaks (personal communication, November 16, 2017). There is also potential for businesses that become sponsors to purchase parking spaces to leave vacant or use in a different way during the Car-Free Day (R. Fataar, personal communication, October 31, 2017).

Another factor the City of Cape Town must consider is the safety. However, this is to be considered more highly if the initiative increasingly becomes an event, as a safety risk assessment and management plan would need to be created. This could create substantial opposition to this day because of the monetary costs that would need to be allocated (M. Hendricks, personal communication, November 9, 2017). During the EcoMobility Festival, opposition to the Car-Free Month came from people who still felt unsafe while using the public transportation (Vegter, 2015). To combat this, it is important that the City of Cape Town take measures to increase security on the public transportation, at stops where residents wait for public transportation, and on the streets of the area.

## Stellenbosch as another Viable Location

When exploring another location of the Car-Free Day, the Stellenbosch CBD was considered because of congestion, lack of available parking, and a reliance on private vehicles. When considering large events and times to pair with Car-Free initiative, Jacomien van der Merwe identified the Stellenbosch Cycling Week during Transportation Month as a possibility. This has a large established community following and has the potential to raise community participation. This can also be incorporated into the marketing campaign and communication strategy. However, considerations about exam times during Transportation Month for students would have to be considered (personal communication, November 8, 2017).

When considering the importance of viable alternative modes of transportation to increase participation of the day, experts of the University of Stellenbosch discussed how the main problem with Stellenbosch is the lack of public transportation. The main mode of public transportation is the informally run minibus taxis, leaving people who need to commute into the CBD with limited options. As a result, the lack of viable alternatives within Stellenbosch has resulted in a private vehicle dominated area. Forty-three percent of all students use private vehicles as their main mode of transportation, and 83% of the university staff use private vehicles to commute to work. However, 90% of all cars are idle within parking lots during work hours (J. van der Merwe, personal communication, November 8, 2017; R. Kgwedi, personal communication, November 8, 2017). However, Jacomien van der Merwe noted how "Stellenbosch is much better in terms of non-motorized transport" because everything within the area is much closer together (personal communication, November 8, 2017).

When addressing issues of viable alternatives within the CBD, Reginald Kgwedi discussed the importance of utilizing Park&Ride services, much like the ones created for the Sandton-South Africa EcoMobility Festival. Sean Cooke also suggested the idea of shuttles from Techno Park and the edge into the Car-Free zone (personal communication, November 27, 2017). Carpooling and corporation shuttle services also have the potential to be heavily utilized. When evaluating public acceptance and possible alternatives within Stellenbosch, non-motorized transport is favored. Additionally, because Stellenbosch is based around the University of Stellenbosch and is not a densely packed city like Cape Town, walking and cycling are safer because there are fewer cars. In terms of non-motorized transport safety, Jacomien van der Merwe also noted the differences between the Cape Town CBD and the Stellenbosch CBD, noting that cycling and walking within Cape Town can be dangerous, stating "Stellenbosch is better because kids and everyone will be able to cycle into the area from far away" (personal communication, November 8, 2017). Additionally, the University of Stellenbosch has an established bike share program that is easily accessible to students.

In terms of oppositions, the Stellenbosch CBD will have many of the same oppositions that the Cape Town CBD does. A proper traffic management plan must be considered to reduce congestion around the zone. Viable alternatives would need to be available and sustainable transport businesses and operations would need to work together to create a successful day for all. Media and marketing the initiative would be essential to inform the public and encourage participation. Businesses and restaurants would need to be involved to incentivize the day. An overall increase in security on the streets would be needed to promote participation and make residents feel more comfortable when using alternative modes and walking to and from locations.

## Public Acceptance of a Car-Free Day


Figure 7: Cape Town Residents' Perceptions of Car-Free Days

We interviewed 24 residents in the Cape Town CBD with 12 public transport users, nine private vehicle users, and three non-motorized transport users (see Table 4 for details). We interviewed 20 residents in the Stellenbosch CBD with two public transport users, six private vehicle users, and 12 non-motorized transport users. Out of the 24 residents interviewed in Cape Town, 21 believed that a Car-Free Day is valuable. Of the 20 residents interviewed in Stellenbosch, 17 believed that a Car-Free Day is valuable, and only three believed it was not valuable initiative. When asked what words or phrases come to mind when thinking about a "Car-Free Day", 40% of residents within Cape Town believed it represented safety and less chaos. In Stellenbosch, only 5% responded with the characteristic of safety. When interviewing residents using private vehicles to commute to work, questions were asked about what alternate mode of transportation they would use on a Car-Free Day. Additional questions were asked about potential incentives that would encourage them to participate on the day (i.e., free MyCiTi fare, expanded bike share opportunities, free shuttle services).

In Cape Town, of the nine private vehicle owners, the most favored option was carpooling (n=3). Similarly, three out of the six private vehicle owners interviewed in Stellenbosch also indicated that they would carpool. All 12 non-motorized transportation users in Stellenbosch would not change their mode of transportation on a Car-Free Day when asked about incentives. This reflects the shared perception of a safe and efficient walking and cycling infrastructure in Stellenbosch.


Figure 8: Stellenbosch Residents' Perceptions of Car-Free Days

| Interviewees | Indvs. who expressed it is a valuable initiative | Alternative mode of travel | | | | | |
|---|---|---|---|---|---|---|---|
| **Cape Town** | | **Minibus Taxi** | **MyCiTi** | **NMT** | **Carpool** | **Metrorail** | **Stay at home** |
| **Public Transportation Users (n=12)** | 12 | 3 | 5 | 2 | 0 | 1 | 0 |
| **Private Vehicles Owners (n=9)** | 6 | 1 | 1 | 2 | 3 | 0 | 1 |
| **Non-Motorized Transportation Users (n=3)** | 3 | 0 | 1 | 2 | 0 | 0 | 0 |
| **Total (n=24)** | **21** | **4** | **7** | **6** | **3** | **1** | **1** |
| **Stellenbosch** | | **Minibus Taxi** | **MyCiTi** | **NMT** | **Carpool** | **Metrorail** | **Stay at home** |
| **Public Transportation Users (n=2)** | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| **Private Vehicles Owners (n=6)** | 3 | 1 | 0 | 2 | 3 | 0 | 0 |
| **Non-Motorized Transportation Users (n=12)** | 12 | 0 | 0 | 12 | 0 | 0 | 0 |
| **Total (n=20)** | **17** | **3** | **0** | **14** | **3** | **0** | **0** |

Table 4: Data Gathered from Interviews with Residents from Cape Town and Stellenbosch

# Conclusion

In imagining a Car-Free Day in Cape Town, we suggest that the first initiative be paired with an established public event. For instance, Cape Town hosts First Thursdays, an event that happens every month which art galleries in the central business district of Cape Town are open to the public for free, drawing people to the CBD and giving everyone an opportunity to participate. First Thursdays was chosen because it is an established event in Cape Town with a large following that already uses non-motorized transport. Although this day does attract a specific portion of the population to the CBD (upper class, usually white, young age group), the number of active participants, and the open invitation to all, has the potential to help get the first iteration of the Car-Free Day off the ground. Essentially, the Car-Free Day is not there to increase the success of First Thursdays; First Thursdays is being used to start a Car-Free Day successfully. The hours for the Car-Free Day would begin in the morning and extend into the night (06h00-21h00). Having the Car-Free initiative extend all day on a weekday will create the most impact by forcing people that work in this area to change what mode of transportation they use to get to work. As a result, different socio-economic populations have the opportunity to interact, people could be brought out of their comfort zone, and new experiences can be made through utilizing public transportation and non-motorized modes.

Based on discussions with experts and research of the Cape Town CBD, Figure 9 displays the ideal area for the Car-Free Day in the Cape Town businesses district. It is enclosed by M60, M3, M62, and Walter Sisulu Avenue. Within this area, there are two designated zones: a Car-Free zone and a discouraged car-use zone. The Car-Free zone is outlined in green. In this zone, private vehicles will not be allowed to enter. Only public transportation and non-motorized transport will be allowed. This zone is approximately 64 city blocks. This Car-Free zone will cause disruption, but it is small enough to not disturb the total economic productivity of the CBD. This area also includes Green Market Square, an area with shopping and restaurants that is already closed to private vehicle traffic. The discouraged car-use zone is highlighted in yellow, which is approximately 175 blocks. The zone includes more First Thursdays attractions that are spread out farther throughout the CBD. Private vehicles will be allowed to enter the zone, but carpooling, all public transportation, and non-motorized transport will be encouraged.


Figure 9: Proposed Car-Free Zone (Created Using Google Maps)

When considering the traffic management plan of the Car-Free zone, the enforcement and entrances will be centered around the streets on established MyCiTi transportation routes (see Figure 10). These entrances could be manned by traffic officials and allow for other forms of public transportation to enter. It is possible that because First Thursdays already has traffic officials on site, they may be relocated to these entrances, eliminating the need to hire any new officers. All other roads in the zone will be closed off by roadblocks. The major roads on the edge of the zone, such as Strand Street and Buitengracht Street, will be left open in order to limit congestion as much as possible.

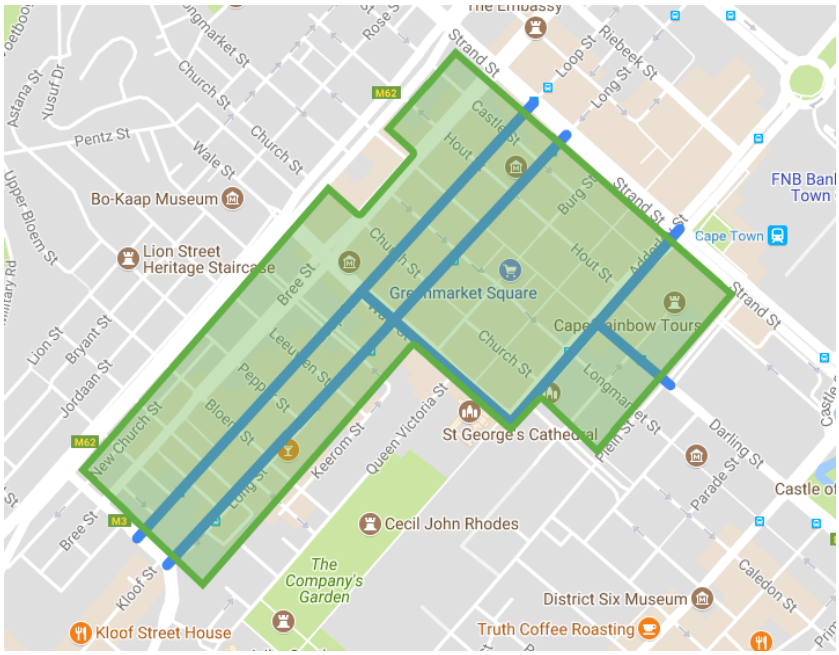


Figure 10: MyCiTi Bus Routes throughout Car-Free Zone (Created Using Google Maps)

Within the zone, alternative modes of transportation are available to travel into the Car-Free area of the CBD. Buses and minibus taxis are allowed to enter. Additionally, Park&Ride facilities are available for people who utilize the Metrorail. Non-motorized transportation is another viable option. As seen in Figure 11, there are many commuter bike routes that can be used to travel to and from the CBD. Because Cape Town's public transportation is not completely developed yet and has a negative stigma in terms of accessibility, safety, and efficiency, there have to be incentives to encourage private vehicle owners to take these other modes of transportation.

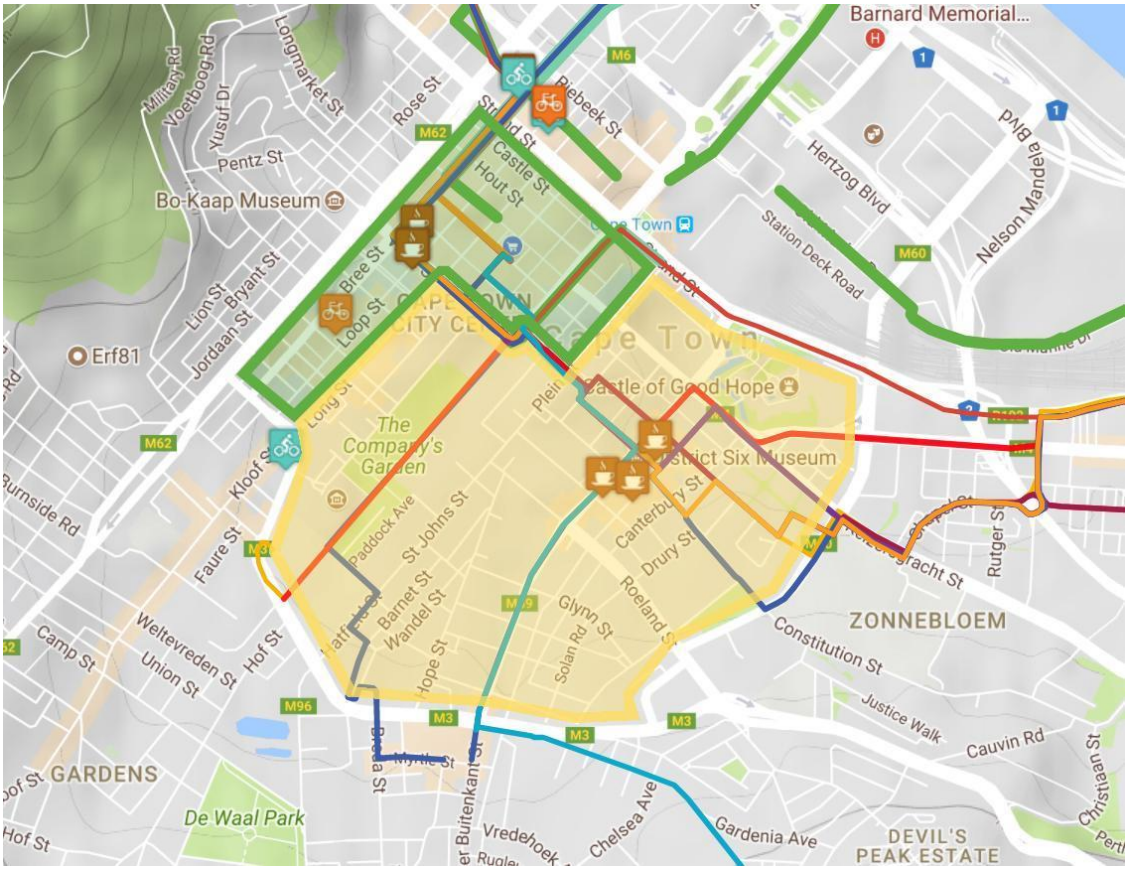


Figure 11: Map of Bike Lanes within Both Zones (Bicycle Cape Town, 2012)

When looking at ways to increase ridership on the buses, MyCiTi services should ideally be expanded. More fleets should be available and operating hours should start earlier and end later so people can utilize this service coming and going from the CBD on this day. Another way to incentivize ridership is by offering free MyCiTi fares on the day of this initiative in the hopes that people will be more willing to utilize this mode. MyCiTi already hosts free fare days, so implementing one during the Car-Free Day seems viable. Minibus taxis are an efficient service, but uncertainty about informal operations and accessibility have created a negative stigma. To increase ridership on minibus taxis, the information about routes would ideally have to be integrated into an online application so people have access to this information. Additionally, the Park&Ride facilities at the rail stations have the potential to be utilized as places where people can park and be shuttled (or walk or cycle) into the CBD. Ideally, minibus taxis can operate as shuttle services that travel back and forth from Park&Rides. The concept of Park&Rides can also be applied to large parking areas surrounding the CBD or the parking lots of universities. When looking at current cycling infrastructure, the City of Cape Town could provide pop-up cycle lanes throughout the Car-Free zone to create a safer space for cyclists. Cycling organizations have the potential to organize large group rides along major commuter bike routes to create a safer environment. Since the data collected from the residents shows that most private vehicle owners would prefer to carpool on a day like this, partnering with carpool companies would be an effective way to encourage the participation of this section of the population. On this day, carpooling platforms will ideally engage with the event on social media. From here, people can carpool to Park&Rides or parking lots outside of the Car-Free area and use other modes of transport to get into this area of the CBD. This will also encourage participation within the discouraged-use zone.

Another way to increase awareness of the alternative modes is to hold workshops to increase resident knowledge of the various systems. This can be applied to the minibus taxi industry. The minibus taxi industry can ideally teach people how to properly use the system and market it to residents during the Car-Free Day. MyCiTi could also hold a workshop on where to purchase bus cards, and can even give out preloaded cards to encourage people to continuously use the service. Additionally, Bicycle South and other cycling organizations can hold workshops on how to bike safely alongside the roads with motorized vehicles.

Incentivizing and engaging with the community will also increase participation. One strategy is getting people to pledge to use alternative modes of transportation online. Anyone who pledges online will receive a voucher that can be redeemed at participating cafes and shops in the CBD to get special deals and discounts. Another way to incentivize participation is to get large corporations to sponsor and become partners in the day. By becoming involved in the Car-Free Day, corporations are promising to encourage their employees to commute to work in a different way. The company would ideally initiate a corporate carpooling program or provide employees with a shuttle service from parking areas outside of the CBD. In return, they will be publicized as a sustainable partner of the event.

A quality marketing campaign is essential to communicate the traffic management plan, viable alternatives, and incentives to participate. It is important that people understand the purpose of the initiative, the interventions within each zone, and understand how to become more engaged in the Car-Free Day. Information will be on billboards, in store windows, on the radio, and circulated on social media. Many of the organizations within Cape Town (Bicycle South, UpCycles, JumpIn Rides, uGoMyWay) will engage with the followers on social media to spread the word a spark a public debate. Social media can also be used to create '#CarFreeCPT', making it a platform on various social media for people to showcase their alternative mode of transportation.

This first iteration of a Car-Free Day in Cape Town will encourage people from all socio-economic populations to participate. Additionally, the initiative will not only begin to address the various issues of community severance, congestion, and pollution, but it will also show residents new ways to view their streets and travel around their city. With success, OSCT can continue iterations as they please, and the entire city can unite to work toward creating a more socially inclusive and visionary city.

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